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SPECIFICATION FOR 2½-INCH DOUBLE-JACKETED COTTON RUBBER-LINED FIRE HOSE

Compiled and Promulgated by the
**AMERICAN MARINE STANDARDS
COMMITTEE**

Approved January 25, 1926
as American Marine Standard O No. 3-1926



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FOREWORD

The American Marine Standards Committee has issued a list (O No. 1-1926) of essential kinds and sizes of hose for ship equipment, as a statement of actual needs for marine service, for general guidance of purchasers in the marine field. It is part of the national campaign for elimination of waste by promoting uniformity of requirements and preventing a needless variety of products. It is issued in the interest of economy in manufacture, stock handling, and ship operation.

Standard specifications are to be issued by the committee to cover the several kinds and sizes in the list, to define the grades deemed essential for reliable and economical service, and thus to establish a fixed basis for purchases.

The specification herein presented is one of the series. It is substantially identical with the standard specification of the Underwriters' Laboratories which was chosen because of its established standing among manufacturers and dealers, and is regarded as defining the minimum requisite grade of hose of this character for ship use.

It is part of the program of the committee to keep its publications in step with developments in products and practice, and users of the specification are invited to cooperate by reporting any difficulty encountered in its use, with suggestions for improvement.

This specification does not include couplings. The American Marine Standards Committee has indorsed for application to fire hose for ship equipment the National (American) Standard Fire Hose Coupling Screw Thread approved by the American Engineering Standards Committee in May, 1925

SPECIFICATION FOR 2½-INCH DOUBLE-JACKETED COTTON RUBBER-LINED FIRE HOSE

I. PURPOSE

This hose is designed for fire-protection purposes.

CAUTION.—The cotton jackets of this hose will deteriorate rapidly if not thoroughly dried immediately after use, or if installed where exposed to dampness or the weather, or if brought into contact with oils or acid. Rubber-lined hose is not suitable for use where it will be exposed to excessive heat.

Double-jacketed hose of this type is for use on pumping engines and in places where service conditions require the additional protection against wear afforded by the extra jacket.

The hose should be subjected to a hydrostatic pressure of about 100 pounds per square inch at least once a year, to determine its suitability for continued use.

II. MATERIALS

(A) Rubber Parts.

1. The lining must be made of a properly vulcanized rubber compound which must sustain all the tests required under VI. It must consist of not less than three calendered sheets in one solid body and must be lap-jointed with the lap as small and neat as is consistent with good results.

2. The backing, if used, must not exceed 0.028 inch in thickness. It need not be of the same composition as the rubber lining, provided the adhesion between the rubber lining and the cotton jacket be such as to meet the test required under VI.

(B) Cotton Jackets.

The cotton jackets must be well, evenly, and firmly made from good cotton, as free from unsightly defects, dirt, knots, lumps, and irregularities of twist as is consistent with good manufacturing practice, and must withstand the tests required under VI.

III. CONSTRUCTION

(A) Hose in General.

The hose must be made with a rubber lining and with two cotton jackets. The jackets may be separate or interwoven.

The hose must be made in the trade size designated as 2½-inch, and must have an internal diameter not less than that indicated by the trade size.

The hose must be furnished in lengths averaging 50 feet.

The hose must be flexible and easily coiled.

(B) Rubber Parts.

The lining must be smooth and practically free from pitting and other imperfections, and from corrugations.

The lining must be not less than 0.058 or more than 0.072 inch in thickness, dimensions being exclusive of backing.

(C) Cotton Jackets.

The cotton jackets must be seamless, and have the fillers woven around the hose throughout its lengths and the warps interwoven with and covering the fillers.

(D) Attachment of Couplings.

The couplings must be attached to the hose in a workmanlike manner without cutting the lining nor rupturing the cotton jackets, and must withstand the pressure test described in VI without use of tape or rubber tissue as a filler. Each coupling of the expansion ring pattern must be provided with an accurately fitted rubber gasket at the end of the hose beneath the expansion ring.

(E) Weight of Hose.

Each 50-foot length of hose complete with couplings must weigh not more than 70 pounds.

IV. WORKMANSHIP

The character of the workmanship must be such as is incident to good practical manufacturing.

V. MARKING

Each length of hose must be indelibly marked with the maker's name, the month and year of manufacture, and the words: "Tested to 400 pounds." These marks must be in two places on each length of hose and must begin approximately 4 feet from the couplings. Letters and figures must be at least 1 inch in height.

The line must also be marked with a distinctive and conspicuous identification consisting of colored threads woven into the fabric. The color lines must be dyed from fast colors so that they will neither wash nor fade to an extent that will render them difficult to distinguish, provided the hose is given reasonable care.

Each length of hose must bear the inspection label of Underwriters' Laboratories as evidence of compliance with these requirements.

VI. TESTS**(A) Tests on the Length of Hose as a Whole.**

HYDROSTATIC PRESSURE TESTS.—(x) *Test for imperfections.*—The hose when lying straight must be capable of withstanding a hydrostatic pressure of 400 pounds per square inch, held for five seconds without leaking, sweating, nor breaking the threads of the cotton jackets, nor leaking at the couplings when such are attached at the factory. It must not contract in length or diameter nor rise from the level of the test table at any point, or warp more than 20 inches from a straight line drawn from coupling to coupling. The elongation must not exceed 9 per cent. The hose must not turn more than 15 degrees per foot and the final twist must be in a direction to tighten rather than loosen the couplings. Each length must be so tested.

(y) *Kink test.*—The hose when kinked must be capable of withstanding, without failure, a hydrostatic pressure of 300 pounds per square inch held for five seconds. One full length in every lot of 500 feet or less of each kind and size of hose must be so tested.

(B) Tests on Test Specimens.

1. **BURSTING STRENGTH TEST.**—The hose when lying straight or while curved to a radius of 27 inches must be capable of withstanding without failure a hydrostatic pressure of 600 pounds per square inch. A 3-foot sample cut from one full length in every lot of 3,000 feet, or less, of hose must be so tested.

2. **TESTS OF RUBBER PARTS.**—The rubber parts of the hose must be capable of withstanding the following tests: An 8-inch sample cut from any place in one full length in every 1,000 feet, or less, of hose must be tested, excepting that chemical test must be made on a sample cut from one full length in every 3,000 feet, or less, of hose.

(w) *Adhesion test of backing.*—The adhesion of the backing, if used, to the lining and the cotton jacket must be such that separation of lining from jacket on a test piece $1\frac{1}{2}$ inches in width will not be at a greater rate than 1 inch per minute, with the application of a weight of 12 pounds.

(x) **PHYSICAL TESTS OF LINING.**—Test specimens will be buffed to remove the backing.

(a) Less than one month from date of final vulcanization: The permanent elongation or recovery 10 minutes after the release of test pieces one-half inch in width which have been held stretched for 10 minutes from 2 to 10 inches must not exceed 25 per cent.

The elongation at the breaking point of test pieces one-half inch in width not previously tested for recovery must be at least 2 to 12 inches.

The tensile strength of test pieces one-half inch in width not previously tested for recovery must be at least 1,600 pounds per square inch.

(b) Up to one year from date of final vulcanization: The elongation at the breaking point of test pieces one-half inch in width not previously tested for recovery must be at least 2 to 10 inches.

The tensile strength of test pieces one-half inch in width not previously tested for recovery must be at least 1,200 pounds per square inch.

(y) *Chemical tests of linings.*—The sum total of the results of tests for acetone extract, alcoholic potash extract, chloroform extract, ash, and total sulphur (exclusive of barytes) shall not exceed 67 per cent by weight of the total compound.

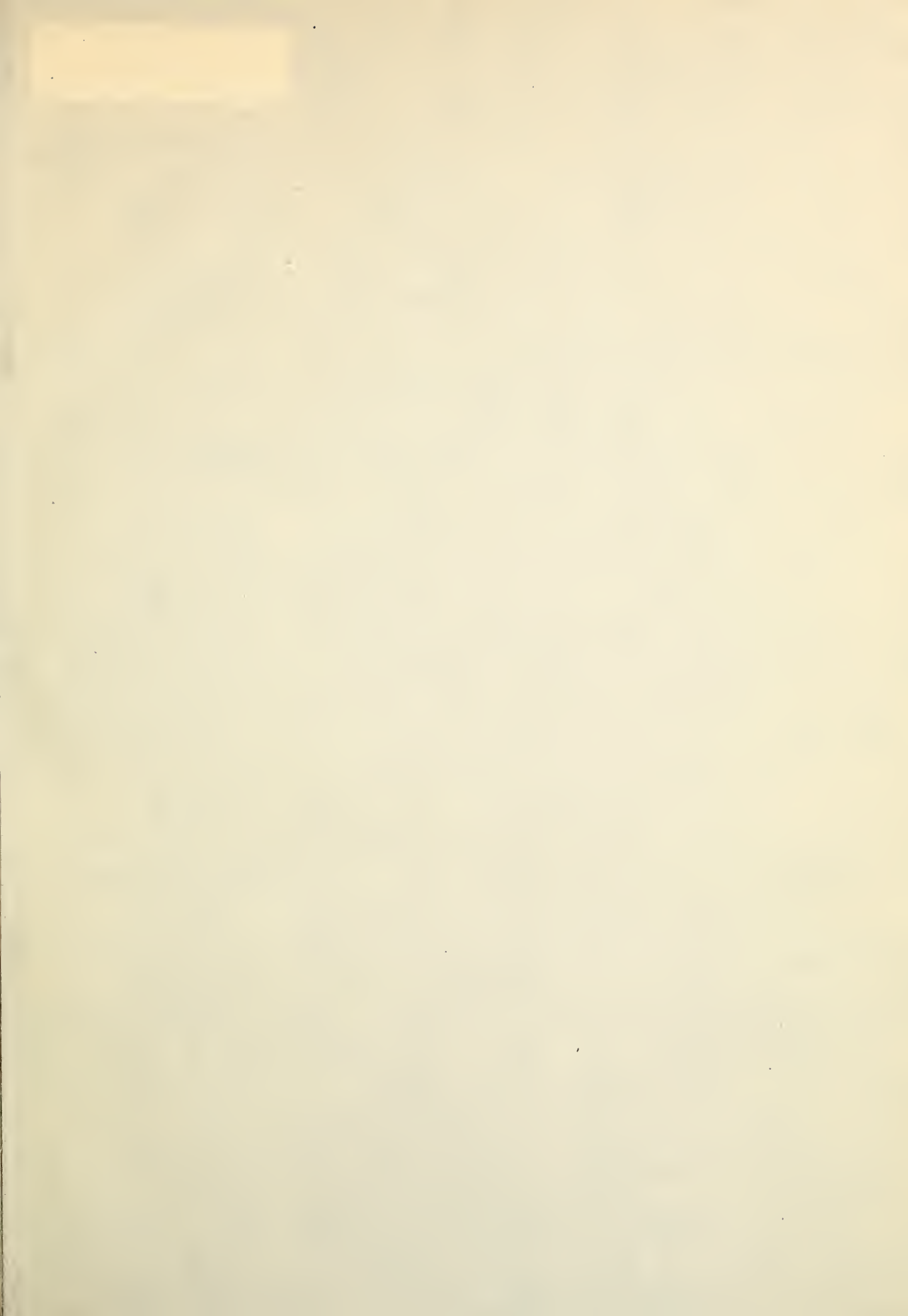
The acetone extract must not exceed 4 per cent; the alcoholic potash extract must not exceed $1\frac{1}{2}$ per cent; the chloroform extract must not exceed 2 per cent; the ash must not be less than 50 per cent nor more than 57 per cent; the total sulphur (excluding barytes) must not exceed 4 per cent; and the free sulphur must not exceed $1\frac{1}{4}$ per cent—all percentages being by weight of the total compound.

(z) *Life test of lining—Up to three months from date of final vulcanization.*—The tensile strength of test pieces one-half inch in width which have not been previously subjected to recovery test, but which have been subjected to a dry heat of 158° F. for a period of four successive days of 24 hours each, must be at least 900 pounds per square inch.

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